

Water Power Development at the Falls of the  
Chattahoochee, 1828  
Columbus  
Muscogee County  
Georgia

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## HISTORIC AMERICAN ENGINEERING RECORD

Water Power Development at the Falls of the Chattahoochee

HAER GA-22

Location: The Chattahoochee River falls through Muscogee (Columbus) and Harris Counties, Georgia.

Construction Dates: 1828-1959

Original Owners: Creek Indians

Present Owners: The People  
(Riparian Rights: Georgia Power, the City Mills Company, and Reeves Brothers, Inc. (Eagle and Phenix).

Significance: As the Chattahoochee crosses the fall line at Columbus, Georgia, it falls 125 feet within 2 1/2 miles producing a potential energy of between 66,000 and 99,000 horsepower. That water power made Columbus one of the leading industrial centers within the South, attracting investors and entrepreneurs. As early as 1828 the river powered a grist mill and by the 1840s it supplied power for several textile mills. By 1880 Muscogee h.p. per sq. mile was greater than any other county south of New York. Conversion of that power to electricity began with arc lighting in 1880. The first central station hydroelectric plant started operating in 1894. Since that date, four other dams (1900, 1911, 1928 and 1959) harness the Falls of the Chattahoochee developing 115,000 kilowatts.

Historians: John S. Lupold  
J. B. Karfunkle  
Barbara Kimmelman August 1977

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## Water Power Development at the Falls of the Chattahoochee

In 1827 after the Creek Indians ceded their lands to Georgia, the state legislature authorized the establishment of Columbus as "a trading town . . . near the Coweta Falls on the Chattahoochee River," the northernmost navigable point on the river. [1] From that date until at least the 1930s the history of Columbus remained intertwined with the development of the river. The Chattahoochee provided the most important impetus for the City's economic growth, initially serving as a transportation artery and then, more importantly, as a source of power for manufacturing and eventually for the generation of electricity.

During its first three decades Columbus flourished as a "trade town" because of the importance of the Chattahoochee as a means of transportation. Columbus served as a commercial center for a large interior area: halfway to both Macon to the east and Montgomery to the west, and as far North as Fulton County (now Atlanta). In the early autumn wagons from those areas and small boats from down river brought their cotton to Columbus; the Chattahoochee then carried the staple crop to national and world markets. During that period the town depended upon the planters and their cotton for both economic prosperity and social activity. In the early 1840s the Columbus Enquirer described "the magic influence possessed [by the planters] to convert the dullness and solitude of a half-deserted city" into a "bustling, lively, animated" place. "It is the great staple that sets all the springs of trade in motion. The planter is decidedly the greatest personage in all creation. But for him, the world would positively go into perfect stagnation." [2]

In the 1850s when railroads reached the area the planters' dependence on the town declined, as commercial importance of both Columbus and the Chattahoochee waned. Columbus failed to become a major railroad center like Atlanta or Macon, and initially its rail connections to the east and west were merely branch lines. This new mode of transportation shifted the markets to which planters shipped their cotton. Many of them within the former commercial sphere of Columbus began sending cotton directly to larger city such as Savannah or Charleston rather than to Columbus warehouses. River commerce continued but on a much smaller scale. Until 1930 steamboats linked Columbus with farms and small communities down the river. [3]

While its utilization as a means of transportation declined, the use of the Chattahoochee as a source of power increased steadily after 1828. During the period from 1828 through the 1890s water wheels and turbines converted the river's energy to mechanical power for driving a wide variety of industries, and from the 1890s on entrepreneurs developed it as a source of hydroelectric power. The power of the Chattahoochee as it thundered over the fall line was impressive. Rapids occurred on the river for 35 miles from West Point to Columbus, and at the Falls of the Chattahoochee (the last 2 1/2 miles of its descent) it fell 125 feet producing a minimum of 66,000 horsepower and a maximum of 99,000. [4]

The federal government first realized the potential of the Falls of the Chattahoochee as an energy source for manufacturing. In 1827 the U. S. Senate ordered the Corps of Engineers to survey the Columbus site along with 12 others in Ohio, Pennsylvania, Tennessee, Indiana, and Kentucky as possible locations for federal arsenals (WPD photo 1). The \$267,549.93 proposal for the Falls of the Chattahoochee envisioned a dam (near the present City Mills) and a 1 1/4 mile long power canal along the eastern bank. The canal would carry water to four separate structures between the southern end of the canal and the river with each building being powered by a 16-foot breast water wheel. The engineer, Captain J. L. Smith, optimistically assessed the water flow there as being superabundant and determined that high water would stop the operation only one day each year, but the arsenal was never built. The high cost of transporting raw materials to the location canceled out its tremendous water power potential (\$1,260 per year compared to \$367.50 for Pittsburg). [5] The transportation differential would not disappear as the city grew; its geographical location meant high prices for raw materials coming in and high cost for manufactured goods going to a larger market. So, rather than manufacturing for a national market, the water power of the Chattahoochee would initially be used to convert local raw materials, primarily corn and cotton, into products for a regional market.

#### I. ANTEBELLUM HYDRO-MECHANICAL POWER

In 1828 near the proposed location of the federal arsenal, the first actual dam at the Falls of the Chattahoochee began supplying water power to the City Mills, a grist mill. This wooden dam meandered across the river, doing little more than diverting the flow of water toward the mill's waterwheel. [6] The property belonged to Seaborn Jones, a wealthy planter and entrepreneur from middle Georgia and he would be one of many such business men attracted by the economic potential of Columbus and the river. His grist mills and other similar operations continued to play an important role in the city's economy, but were soon overshadowed by textile manufacturing. In 1834, a Captain Johnson began construction on the Columbus Factory, a textile operation 3 miles north of the town, supposedly the second such mill in Georgia. The Creek Indian War of 1835-1836 delayed its completion and it began operating in 1838. Johnson initially formed a dam by throwing a tree across a gorge and nailing some planks to it. Presumably the dam just channeled the water into a natural raceway formed by existing stones (WPD Photo 2). In the 1840s a new group of businessmen led by J. R. Clapp purchased the property. From then until the 20th century the site has been known as Clapp's Factory (WPD Photos 3 & 4). In addition to its small textile production (1,800 spindles and 32 looms) the operation included a grist mill and a tanning establishment. In 1852 Clapp acquired a charter to build a wing dam from the shore to a small island in the river spanning no more than 1/3 of the river in order to divert the water. [7]

Obviously, the natural characteristics of this site made it ideal for small manufacturing, but in the 1840s it could only sustain a small operation. The Capital required to build a complete dam and power canal at that site (the present location of Oliver Dam) was too great, and the engineering too sophisticated, for the 1840s.

During the 1840s Columbus made a concerted effort to harness the water power within the city's limits and to attract industries to that site. Rather than retaining control of this property, the city council opted to allow private entrepreneurs to initiate and guide the development of the water front. In contrast, on the other side of the state, the city of Augusta kept control over the power canal it constructed to promote industrial growth. [8]

In Columbus the city transferred the property to private investors at low prices, with the stipulation that it be developed. In December of 1841 the city delineated 37 waterfront lots (72 feet wide) and sold the even numbered ones to John H. Howard and Josephus Echols for \$1,000 provided they built within 5 years and kept "forever in good repairs" a dam and a head race for those waterfront lots (See drawing #2, Evolution of Dam Sites).

The city also sold the northernmost lot (#1) for \$150 provided the owner erect machinery driven by the river. Howard and Echols also acquired that site. After a heated political debate, many Columbusites evidently disapproved of the arrangements made with Howard and Echols council in 1843 agreed to sell Howard and Echols the remaining odd numbered lots for \$5,000. They then controlled the entire potential water power within the city of Columbus.

By 1844, Howard and Echols completed the dam and raceway through lot #20; the council released them from the stipulation to extend it all the way to lot #37. The original dam (located just south of the present 14th Street bridge) probably served to divert water to the eastern side and only partially spanned the river, since the channel hugged the Georgia side at that point in its flow. A raceway, or small power canal, approximately 20 feet wide extended southward from the dam. Water flowed from this head race through flumes that carried it above the tail race channel to the wheels (and later turbines) and then exited into the tail race immediately adjacent to the Georgia shore. The head of water at lot #2 measured 5 feet and increased in height on the other lots, since the canal was level. Howard and Echols spend \$7,000 constructing this system.

In 1845 Echols sold his interests in this development to Howard, and Howard organized the Water Lot Company which assumed control of the industrial lots within Columbus. Any investor planning to erect a factory there bought the lot and water rights from the company and that individual in turn paid his proportional share for maintaining the dam and raceway.

The size of his responsibility depended of the number of factories utilizing the water power. Howard sold one lot and its water rights for \$7,000. If he had sold all 19, he would have realized a nice return on his \$23,000 investment, but only five were developed by 1860. [9]

During the 1840s the number of industries along the Columbus raceway slowly but steadily expanded. In 1842 construction began on the Coweta Falls Factory at lot #1. Howard retained half interest in this concern, and its active managers, George Smith and Jonathan Bridges, owned the other half. A five foot Rich's center-vent wheel turned the machinery in this factory. Initially its power went to a machine shop that manufactured all the spinning frames and looms used in this mill, and in other factories in Columbus and other parts of Georgia and Alabama. The Coweta Falls Factory started manufacturing textiles on a limited scale in 1844 and with all of its 1100 spindles and 20 looms by 1845. [10] (for more details about Coweta Falls Factory see Muscogee Mills report).

The inauguration of that mill led Columbusites to predict a bright industrial future for the city. In December of 1844 the Columbus Enquirer proclaimed: "There is a large cotton factory on the river nearly completed, which we hope to see followed by many more, which will doubtless be the case, as the falls in the river at the city afford the finest water power in the world." The activity and motion once supplied by the planters was to be replaced by the industrialists. In 1845 John Howard assured the city council that the power from the upper race could turn 200,000 spindles. Even Augusta recognized the Coweta Falls Factory and urged its citizens not to fall behind Columbus in the development of industries. [11]

Undoubtedly the apparent success of Coweta Falls attracted investors to Columbus. In 1845 Farish Carter of Milledgeville, one of Georgia's wealthiest planters, purchased interest in Coweta Falls. During the 1840s cotton prices had declined and Carter sought other areas in which to invest his capital. In the fall of 1845 he started building his own 6 story brick factory, south of the Coweta Falls Factory. He planned to use slave labor to operate 10,000 spindles and 200 looms. [12]

Carter's returns on his investments in manufacturing failed to meet his expectations. The Coweta Falls Factory, experienced financial difficulties and sought loans from banks and from the principal stockholders, including Carter. The company later (1859) defaulted on some of those loans. Perhaps partially as a result of his experience with Coweta Falls, Carter's interest in manufacturing waned; he never placed any machinery in his new factory building, which was completed by 1849. The rise in the price of raw cotton also influenced his decision to suspend further investment in manufacturing and to use that money to buy more land and slaves instead. Carter always treated the Columbus factories as secondary interests and only rarely visited the town. [13]

Despite the problems experienced at Coweta Falls Factory and at Carter's Factory, entrepreneurs continued to establish new factories along the raceway. In 1846 John G. Winter and William Brooks began constructing two large buildings not devoted exclusively to textiles. Brooks' variety works, located on the western side of the raceway on an island, manufactured all types of sawn and planed lumber products and by 1845 Brooks also ran a 3,000 spindle textile operation. Winter's Palace Mill at the very end of the race, primarily ground corn and wheat, but it also housed a machine shop in its basement. [14]

In 1847 a group of investors (not including John Howard) launched the Howard Manufacturing Company. Three years later, construction began on William Young's Eagle Mill. (For more details about the Howard and Eagle Factories see Eagle and Phenix reports; see also E & PH photo 1). Those two relatively large textile mills were the last industries established along the Columbus raceway prior to the Civil War. Compared to Coweta Falls and Carter's Factory the Eagle Mill enjoyed a great deal more success, probably because of Young's capable management.

Young eventually solved some of the problems regarding water power that plagued all of these factories. Both low and high water interrupted the functioning of these industries, and the weak dam and raceway constantly broke or leaked. The wooden upper portion of the western wall of the head race usually failed under high water conditions. Farish Carter's nephew Dr. John Baird, writing to Carter after such an incident in 1851, predicted that "The famous Columbus Water Lot Company will soon be utterly worthless."

With the wall broken, the Coweta Falls Company blocked the entrance to the canal, limiting the water flowing south. The Howard Factory stopped operations and the Palace and Variety works received very little water. "It is said that there is no better water power in the U. S. but" at the time the means of controlling it were "very defective." Howard and Eagle factories even threatened to install a steam engines. [15]

The companies problems with fluctuation of water supply and weak dam construction at times seemed dwarfed by legal difficulties. Endless disputes divided the water users as they sued each other and the Water Lot Company. The owners of the land on the Alabama side of the river, including John Winter, claimed that they enjoyed riparian rights and that the Georgia dam could not be extended to the Alabama side (as it had by the early 1850s) without compensating the Alabama owners. At one point Winter threatened to tear down the western portion of the dam. In 1885 the U. S. Supreme Court ruled that Georgia's ownership extended all the way to the western high water mark, denying Alabama any riparian rights. That decision cleared the way for the Eagle Mill owners to rebuild and improve the dam. Apparently they moved it south to their property and extended it all the way to Alabama. The new configuration eliminated some of the raceway which had created earlier problems, since all of the mills north of Eagle could draw their water directly from the pond. [16]

In spite of the problems involved in trying to utilize the water power of the Chattahoochee, its energy more than any other single factor attracted entrepreneurs and investors to Columbus during the antebellum period. By 1861 Muscogee County, with four companies operating 18,600 spindles, 364 looms, tended 755 operatives, represented the largest textile manufacturing center in Georgia and the second greatest within the South. [17] Not merely a textile center, Columbus with its iron foundries, cotton gin manufacturer, paper mill, and grist mills was already a diversified "New South" city.

The war expanded economic activities within Columbus. The city's industrial contribution to the Confederacy ranked second only to Richmond. The production of Columbus textile mills tripled immediately, and the number and capacities of its iron foundries were vastly increased. New industries developed as a result of wartime demand. Many novices became manufacturers. Cotton factors supervised the making of ropes and rifles, merchants manufactured tents, and jewelers turned to swordmaking, a tinsmith made swords and later pistols, music store proprietors fabricated India rubber cloth, and grocers made shoes. Indicative of the boom, the long empty Carter factory was quickly converted to house sword manufacturing on the basement and fourth floors, the fabrication of shuttles for cotton looms on the second, and a rope walk on the third. [18]

The Columbus industries operated longer than most factories within the Confederacy. In 1864 when General William T. Sherman's forces entered Georgia they remained north of Columbus. Federal forces reached Columbus a week after Appomattox, but neither side knew of Lee's surrender. On April 16, after a brief skirmish on the west bank of the river, General James Wilson's raiders occupied Columbus. During the next two days Wilson's troops methodically burned all the stored cotton, the rolling stock of the railroads, any Confederate supplies to federal cavalry did not need, and all the industries except the grist mills. They fired the Eagle Mill, but spared the Palace (grist) Mill only about 100 feet to the south. [19]

#### Post War Hydro-mechanical Power

The decision to rebuild the burned factories appeared to be almost reflexive. All of the factors prompting industrialization before the war still existed in Columbus. The fire did not affect the thundering Chattahoochee. The river's power, the entrepreneurs, the capital, the markets, the 5,000 employed workers formed the ingredients for the rebuilding of Columbus industry. Encouraged by the local newspapers, the entrepreneurs announced their decision to rebuild immediately, even though implementation of their plans required more time. Old Clapp's factory, using second-hand equipment, began running by December of 1865. The first mill of the resurrected Eagle and Phenix Manufacturing Company, with a capacity larger than the old Eagle and Howard Factories combines, went into production in 1868. The successor to the Coweta Falls Factory, the Muscogee Manufacturing Company, starting operations in 1870 [20] (see Eagle and Phenix Mills and Muscogee Manufacturing Company reports).



In nearly every facet, the post-war industries in Columbus resembled their antebellum predecessors, and water power developments reflect that continuity. Trends beginning before the war continued after the conflict. The two small up-stream sites, Clapp's and City Mills, continued to use the river, while the Eagle and Phenix increased its control over the water lots and water power within the city limits. In 1869 in conjunction with the construction of a second mill building the Eagle and Phenix reconstructed the dam using bed timbers firmly bolted into the solid granite rocks and rebuilt a massive rock wall separating the river from the tail race (E & PH photo 26). In the 1870s after the Palace Mills burned the Eagle and Phenix bought the property and erected their third mill there. At that point the company controlled water lots 2 through 19.

In 1882 the directors decided to refurbish their dam and purchased the City Mills property and all property on the Alabama side between the tow dams, allowing them to modify the water level without any objections from other users. In the summer of 1882 the company built a rubble masonry dam and in early 1883 its officers reported: "Our water power is now permanent subject to little or no repair in the future." That dam still serves the mills today [21] (See drawing #2).

Eagle and Phenix's attempt to control the water power was logical given the history of water developments at that location. Young certainly remembered the antebellum conflicts and probably saw limiting the number of water users as the best way to prevent future controversies. However, the near water power monopoly of the Eagle and Phenix may have slowed industrial development within the city. During the 1870s Columbus newspapers envisioned 185,000 spindles operating by water power within the city, of 2,000,000 within 3 miles above the city, and of 40 factories in the same area. [22] Even though the predictions of the journalists were rooted more in boosterism than in economic or technological reality, the water power within the city never drove even 60,000 spindles at Eagle and Phenix and Muscogee combined.

Despite its failure to reach the levels predicted by its journalists, Columbus did utilize a tremendous quantity of waterpower. According to the 1880 census, Muscogee County generated and employed more horsepower per square mile within the county than any other county south of New York. [23] Even so, the Eagle and Phenix failed to efficiently use its 18 water lots. Lots 2 and 3 remained completely unimproved. The antebellum vision of 19 factories was never realized. By the 1880s, any large scale textile mill with a large power requirement would be forced to build a new dam at an up-stream location, due to the Eagle and Phenix monopoly.

Ironically, the alternative for smaller industries was steam at the Falls of the Chattahoochee. In the 1870s two small steam operations started: the Clegg Factory with 40 looms and the Steam Cotton Mill with 2,000 spindles. In the 1880s two other small weave mills, the Swift and the Paragon (later Hamburger and then Bradley), began on the eastern edge of the city. (WPD

photos 5 and 6). Both of those later expanded into large operations. Even Muscogee relied on steam when it expanded beyond Lot #1. Steam powered its Mill No. 3 built in 1887. By 1900 the river drove approximately 55,652 spindles and 1,870 looms, while steam powered 28,000 spindles and 900 looms. [24]

Muscogee eventually relinquished all of its water rights to the Eagle and Phenix, after a protracted legal battle. In 1898 Muscogee enlarged the entrances to its power houses, thereby, according to the Eagle and Phenix, utilizing more than its entitled share (1/19) of the water. The court refused to support Eagle and Phenix and the two companies finally agreed in 1909 that Muscogee would stop using water power, provided that the Eagle and Phenix supplied Muscogee with 500 horsepower of energy each day [25] (See Eagle and Phenix report for more details). Given the configuration of the dam, powerhouses, and races the decision was logical. Thus the Eagle and Phenix controlled the entire power of the river within downtown Columbus by 1910.

The Eagle and Phenix furnished energy to Muscogee in the form of electricity. During the previous thirty years electricity had revolutionized the application of power to machinery, and the river represented the most logical source of energy for electrical generation in Columbus. In 1880 water drove arc light dynamos illuminating mill No. 3 of Eagle and Phenix, and the company slowly phased from mechanically to electrically driven shafts (1907, 1914, and 1920) as a means to improve efficiency (See Eagle and Phenix report for details).

This conversion did not change the basic function of the company's water power resources. Electricity ran the three mills and Muscogee, and nothing more. The real innovation associated with electricity, the transmission of power over distances, was never applied at the Eagle and Phenix. The Chattahoochee's power at the city's old industrial lots continued to drive only textile operations. The introduction of large scale commercial hydro-electric power necessitated the exploitation of new sites and the construction of new dams.

## II. HYDROELECTRIC DEVELOPMENT

B. M. Hall, expert hydrographer who surveyed all Georgia Watersheds for the Geological Survey of Georgia in 1896, wrote in his report "very few of the large water powers of Georgia are utilized . . . the dawn of the age of electricity has found us (Georgians) with undeveloped powers ready to receive the latest and best machinery without the loss and expense of taking out old machinery." The list of the "great powers of the state that are running to waste" [26] included the "Great Shoals on the Chattahoochee river at Columbus with 120 feet of fall" as third largest in the state. [27] This 120 feet of fall provided power for only one hydroelectric station, at the City Mills dam (with 9 feet of head).

Typical of the "wasted" sites at the Great Shoals of the Chattahoochee was Lovers Leap, 1 1/4 miles north of City Mills. Here, the water rushed through a natural rock lined channel and fell 40 feet. These falls represented a tremendous power potential. Industry had never utilized this fall in the past because the investment required to harness the river at Lovers Leap was very great; the power available, furthermore, was more than enough to serve several mills. In order to distribute this great power in the days of hydro mechanical power transmission, it was necessary for the mills to locate on the river side near the dam. The steepness and ruggedness of the terrain near Lovers Leap precluded the construction of a series of mills such as is seen in downtown Columbus. Hydroelectric transmission technology made this an ideal site for a central hydroelectric power development (See discussion of Bibb/Columbus Power development, later this section).

Advances in electric power transmission did more than transform the possibilities of the series of water power sites above Columbus. Changes in control and organization of the city's power interests reflected the impact of the new technology, as did Columbus' decline as a manufacturing center. The remainder of this report seeks to analyze the relationship between these changes and the development of modern hydroelectric central stations on the Chattahoochee.

#### Early Electric Generation in Columbus

Electric arc lighting was introduced commercially in America in the late 1870's. [28] The Brush Electric Company of Cleveland soon interested a group of Columbus entrepreneurs to organize and raise capital for a local Brush affiliate. [29] The Brush Electric Light and Power Company was incorporated in 1882 in Columbus. [30] The first 20-light Brush arc dynamo was turned by a water wheel in George P. Swift's Muscogee Manufacturing Company after the mill had closed for the night. This dynamo lit several stores in town. By 1885 the Brush Company had extended its service to street lighting and had added a 60-light Brush dynamo to accommodate the new business. By 1887 all major thoroughfares, hotels, mills and steamers were lit by Brush arc lamps powered by the river. [31]

Demand for service grew steadily and more power was required than could be easily harnessed at the Muscogee Mills' wheel house. About 1890 the Brush Company moved its operations to a steam plant on the Paragon Creek (see WPD photo 6). This plant could generate 500 horsepower burning cheap coal. [32] The commercial possibilities of central station lighting plants were also recognized by other Columbus interests. Two independent groups of entrepreneurs organized to produce and sell electricity. One group, the Columbus Electric Company, planned to generate electricity from coal. [33] This enterprise never got off the ground.

The Chattahoochee Falls Company, the second group, owned property and riparian rights at Clapps Factory (See Section 1, this report). They undertook to develop the Shoals at Clapp's Factory to generate electricity for sale, and hoped to put the old factory back into operation. [34] The property held by the Chattahoochee Falls Company was recognized as extraordinary in 1882. "We . . . have (not) seen anything to surpass this water power short of the rapids above the bridge at the Falls of Niagara." [35] It was noted in 1882 that the Clapps Factory site could be developed relatively cheaply. [36] Nevertheless this enterprise failed also.

In 1894 the Columbus Railroad Company built a hydroelectric plant at the City Mills dam (see CRR photo 2). This provided direct current hydroelectric power for the street railway. The local Brush Company rented two turbines in this station to generate light and power, and in March, 1898 the Brush Company, near bankruptcy, was acquired by the railroad. All power and light equipment was transferred from the Brush steam plant to the Railroad Company power house. This station became the first hydroelectric central station in Columbus. It remained the only commercial power producer until 1901, when the Columbus Power Company commenced operations. [37] (See HAER reports City Mills and Power Station of the Columbus Railroad Company for detailed information) Most power used in the city, however, did not come from this plant, but was in fact generated in independent electric plants operated by individual consumers, run for the most part by coal-burning steam plants.

In 1897, G. Gunby Jordan of the Eagle and Phenix Mills, urged apparently by his chief engineer John Hill, started gathering water rights at and around Lovers Leap (at North Highlands) in order to construct a dam for electric power production [38] (See WPD photos 7 - 8b). Jordan was joined in this venture by the directors of the Bibb Manufacturing Company of Macon, Georgia; together these men organized the Columbus Power Company (which in 1900 was purchased outright by the Bibb Company via an exchange of stock). The Bibb Company plans called for a 25,000 spindle mill taking power from the dam (See Bibb photo 1).

As noted at the opening of this section, the North Highlands site was ideal for a commercial hydroelectric plant, and the Bibb Company developed the project accordingly. A rope drive, powered mechanically direct from water turbines, turned the shafting in the Bibb mill; the great surplus of power was then to be sold, and distributed electrically by the Power Company. F. B. Gordon, another Columbus businessman, built the Columbus Manufacturing Company Mill in 1900, 1500 feet south of the Bibb Mill, to take advantage of this power. The rope drive in Gordon's mill was powered by electricity from the North Highlands dam (WPD photo 9; see also Bibb Company, HAER report 1977).

Thus by 1901 there were two competitive power companies in Columbus. The power developments were basically owned and operated by local interests. John Flourney, president of the Muscogee Real Estate Company, controlled the Columbus Railroad Company. G. Gunby Jordan of the Columbus Power Company was, of course, a cosmopolitan resident of Columbus. These men were amateurs, however, in the words of Jordan. Neither company gave very satisfactory service during their early years of operation (see HAER reports in Columbus Railroad and Power Company stations).

### Professionals Take Notice

Outside power interests first investigated the Columbus area in 1899. [39] George J. Baldwin of Savannah, Georgia, was in effect the southern representative of the Stone and Webster group in Boston. [40] He was, at that time, president of 3 electric companies in the south. In Columbus he sought, as he frankly put it, to find "the best method of turning this (Chattahoochee water) power into money." [41]

Baldwin investigated the possibilities for profit in the Columbus Railroad Company and found that it was not a very lucrative venture. He discovered that the Railroad Company had not yet declared a dividend nor even managed to pay back interest on its debts to the Drake and Stratton Company. He noted that since electrifying the railroad, receipts had not increased. Most significantly he found Columbus to be a town which had not shown any population increase in 10 years. The population, further, was mostly poorly paid mill workers. He feared also that the unreliable service of the power and light operation could not compete with the service of the Columbus Power Company whose development was then in the construction phase. [42]

Baldwin was therefore not at first interested in acquiring the Railroad. He found much more interesting the yet undeveloped water rights of the Chattahoochee Falls Company, north of the North Highlands construction. Baldwin envisioned electro-chemical plants, metallurgical works, acetylene production, and a hydro electric plant. His Stone and Webster associated saw potential for the stretch of river to be "a pretty important manufacturing district." [43]

In order to gain a foothold in the Columbus water and power development business, Baldwin did acquire the Columbus Railroad Company in June 1901, nearly coincident with the commencement of operation of the Columbus Power Company. The Chattahoochee Falls Company was acquired soon thereafter. He also began collecting properties north of the Chattahoochee Falls Company holdings in a corporation called the Coweta Power Company.

Baldwin's primary concern was establishing control over the power interests in Columbus. Even before he had made any Columbus acquisitions, Baldwin began to correspond with Major J. F. Hanson of the Columbus Power Company. Late in 1899 he first suggested that it would be to their mutual advantage to cooperate. [44]

While Baldwin was hoping for an expedient consolidation of power interests, Hanson was more concerned with preventing "that foolish competition (which) had destroyed the value of many investments." Hanson simply did not "intend to drift into any (needless competition) if he could possibly avoid it." [45] There was, in fact, a de facto division of business between the two competitors. The Railroad had capabilities primarily for lighting and for small power uses. [46] The Power Company did not have feeders for wide spread lighting service or for small power users. Their lines ran directly to the mills which bought the power in large quantities.

Developments in 1901, involving three downtown power contracts, for consolidation. Muscogee Mills, already a Railroad Company customer, needed more power, and George Woodruff's Empire Mills and the Rankin House hotel complex were considering abandoning isolated steam plants for central station power. Although Woodruff finally installed a new steam plant, Rankin House chose Columbus Railroad power. The Railroad barely had the capacity this new demand, plus the Muscogee increase.

Thereafter the Railroad Company did not have the capacity to take in new power customers without expanding its facilities. In fact, the Railroads inability to meet the Power Company's competition probably kept Hanson from making any agreement with Baldwin at the time. The Power Company would not extend lines into Columbus for small power distribution until it was guaranteed 1500 horsepower consumption. The Railroad Company could not meet such large demands. The threat of actual competition was therefore minimal. [47]

As president of the Columbus Railroad Company, Baldwin had very little leverage in negotiations with Hanson. As president of the Chattahoochee Falls Company, he had a more favorable bargaining position. He had John Flournoy, his local trusted friend who was vice-president of both the Railroad and The Chattahoochee Falls Company and a real estate broker, procure all necessary land and riparian rights not yet acquired which were necessary to develop a dam on Chattahoochee Falls Company property. [48] The cost of development was reasonable, but the demand for power in Columbus alone was not sufficient to warrant another power dam at the Falls of the Chattahoochee. [49] Hanson suggested in December of 1901 that the railroad build instead simply an impounding dam (i.e., without hydroelectric generating facilities) which would regulate the flow of the river by holding water at night and releasing it during the day. Baldwin could not see any profit in this considering Hanson's refusal to agree to stop competition altogether. [50]

The Columbus Power Company dam failed at the close of 1902, crippling the hydroelectric industry of the city and with it Gordon's Mill (the Columbus Manufacturing Company), Bibb Mill, and the Railroad. [51] This drastic demonstration of the need for river regulation led to the signing of an agreement between the Power Company and the Chattahoochee Falls Company. The agreement effectively stopped all power competition. It specified that an impounding dam be built by the Chattahoochee Falls Company. The Columbus Railroad Company and the Chattahoochee Falls Company were restricted to providing lighting service and supplying power to users of less than 75 horsepower. The Power Company served larger customers and did not provide lighting service which was not in conjunction with power service. [52]

The City Mills station of the Columbus Railroad was ited into the Columbus Power Company System at this time. (The early importance and later history of that station are dealt with in the Columbus Railroad Company and the City Mills reports in detail.) Baldwin had bought the Columbus Railroad Company intending eventually to incorporate its hydro power into a much larger system. His intention now led him to purposely underutilize the surplus power capacity available at the City Mills station in order to become a wholesale customer of the Company. Baldwin did not consider the power potential of the City Mills dam to be significant compared to the vast water power which remained unharnessed north of the city. The importance of the station naturally decreased as the great powers upstream were developed. Even before the next big dam on the river was complete [53], however, Baldwin was willing to sacrifice the City Mills station to help consolidate the hydroelectric interests. [54]

By this means, Baldwin at last secured the cooperation of, and inter-connection with, the Power Company. Control over all the power and light interests in Columbus was, however, Baldwin's ultimate aim. Late in 1902 Baldwin became interested in the Gas Light Company of Columbus, a firm which provided gas for street lights, interior lighting, heat, and cooling. [55] It was a competitor of the Railroad Company in the lighting business, but its owner was willing to sell out. [56]

Having acquired the Gas Light Company, Baldwin organized the Columbus Electric Company to hold controlling investment of the capital stock of the Columbus Railroad, the Chattahoochee Falls Company, and Gas Light Company of Columbus. [57] The Columbus Electric Company itself was held by the Stone and Webster group. Through this acquisition Baldwin controlled all commercial lighting within Columbus - incandescent, arc, and gas. Now with a large number of local holdings and consequently greater bargaining power, Baldwin again approached Hanson with another proposition of consolidation. This time Baldwin suggested that the Power Company exchange its own stock for Columbus Electric Company stock. [58] This was not accepted because the Power Company still perceived no economic advantage in actually consolidating the interests. There was still no dam at the Chattahoochee Falls Company site, the 1902 contract assured no competition, and the station of the Power Company was fully loaded. [59]

Difficulties between the two power companies increased during the following years. In March 1903, the Muscogee Manufacturing Company, now a customer of the Columbus Power Company, increased its demand for power by 100 horsepower. In order to meet this, the Power Company reduced by 1/2 the amount of electricity which it sold to the Columbus Railroad, which now relied heavily on Power Company electricity. In periods of low water when the North Highlands plant could not handle its load, the Columbus Railroad was cut off first. Power reaching the Railroad's circuits was often below the set voltage (5500) and was received at less than 60 cycles. [60]

Although plans for the Chattahoochee Falls Company dam were complete, business conditions were so poor that prospects for increased demand for electricity were dim. Stone and Webster directed Baldwin not to build the impounding dam in 1904. [61] The delay in the construction greatly irritated Hanson. The Columbus Power Company had increased the capacity of its station in mid 1904 expecting an impounding dam to be constructed. Hanson complained to Baldwin that the Chattahoochee Falls Company dam "would have largely increased the efficiency of our power", which was still unreliable and below expectation. [62] He then served notice on the contract of 1902 between the Power Company and the Chattahoochee Falls Company.

In fact, Baldwin himself called the electric power service from Chattahoochee water power "exceedingly bad"; he reported the power situation of the 2 power interests as "almost unbearable" and claimed that there was at least 1500 horsepower of unsatisfied demand in the city. [63] On the same day he solicited capital for his dam project from downstream hydro power users, claiming that the water regulation the dam would provide would benefit all Columbus water power developments. This met with no success. [64]

Relations between the Power Company and Baldwin's interests nearly broke down entirely 2 weeks later. The manager of the Railroad believed it was being overcharged for the power it received from North Highlands. He refused to pay the bill to the Power Company. [65] On January 9, 1905 the Power Company cut the wires to the railroad. Baldwin realized it would be best not to rely on the Columbus Power Company for power, but the Railroad simply could not produce enough power on its own. Although the controversy was cleared up within a few weeks [66], the bickering over the dam continued through much of 1905.

In January, 1906 Hanson finally decided to get out of the electric power business. In a transaction probably instigated to secure a lot of quick cash Hanson sold the assets and properties of the Columbus Power Company for \$1,000,000.00. Some of the Bibb Company's properties were transferred also. [67] In March, 1906 the Columbus Power Company was merged with Baldwin's and Stone and Webster's Chattahoochee Falls Company and Coweta Power Company to form the Columbus Power Company. Jordan enthusiastically proclaimed "with Boston brains backed by ample Boston capital our future is assured." [68]



Baldwin and Stone and Webster now controlled all the light and the small electric power market through the Columbus Electric Company, and all of the large electric power market through the Columbus Power Company. Baldwin achieved the consolidation after 7 years of effort. The problems of river regulation and dependable hydroelectric power remained to be resolved.

### III. FURTHER DEVELOPMENTS ON THE RIVER

The consolidated power company could now pursue a rational development of its water power holdings without the unsettling pressures of power competition. A web of economic forces hindered actual development of these powers. A regulating dam upstream was necessary to make the hydroelectric service more reliable and available. Before undertaking such a project sufficient growing demand for the increased generator capacity had to be manifest. The chronic unreliability of the hydroelectric power service in the past had stunted the natural growth of demand for central service. Customers and potential electricity users turned to isolated electric plants operated by reliable steam power.

The resulting situation was that, while the Power Company delayed developing the Chattahoochee Falls site until increased demand was manifest, local interest in central hydroelectric power was decreasing. All the while the company sought to preserve its total control of the power market by actively discouraging competition in any form. The company was playing "dog in the manger" [69] with the valuable water powers of Columbus while maintaining that it was rationally developing the river. At the same time it suppressed the growth of alternative power sources and consequently the growth of the city. Not scientific planning but a clash of various economic and political forces would lead to the next upriver development.

#### Early Disillusionment With Central Station Power

The chronic unreliability of hydroelectric power in Columbus was evident from the beginning. The first development, the power station of the Columbus Railroad, was plagued by fluctuation in river flow. In the early days (1895-1897) the load was not so great that fluctuations in flow to the turbines would affect electric current flow to the street railway motors. When Brush Electric Light and Power Company began operating that location in 1897 the load on the turbines was greatly increased. When water was too low or too high street cars would run "at a walk"; lights would be dim or would not operate at all; power service would be below rated speed and voltage giving rise to "a great howl from the customers." [70]

Service from the "new" dam of the Columbus Power Company at North Highlands (built 1901) promised to be more reliable. The 40 feet of head at the North Highlands dam provided a greater margin for river fluctuation than the 9 foot head available at the City Mills dam. In fact, service was consistently unreliable.

Power service from North Highlands for most of the year 1902 was "irregular". In 1903 silt accumulating in front of the forebay of the upper of two power houses interfered with flow to the turbines and put one of the units out of commission. [71] In 1904 the Morgan Falls dam (at Bull Sluice) was completed 17 miles north of Atlanta on the Chattahoochee by the Atlanta Water and Electric Power Company. Its gates were closed for 3 days to fill the reservoir, leaving Columbus nearly dry. [72]

This incident sparked a great deal of concern among Columbus water power users about riparian rights. The water flow to Columbus was greatly affected by water use in Atlanta and elsewhere upstream. In order to assert the rights of Columbus, Baldwin arranged a meeting of riparian owners which included Jordan, Hanson, Baldwin, G. A. Pearce (City Mills), and W. E. Swift (Muscogee Mills). They decided to organize a more general meeting of riparian owners all along the Chattahoochee from Gainsville, Georgia to Columbus. [73] The meeting was held in May, 1905 in Atlanta. Jordan's lawyers cited a Georgia law stating that riparian owners cannot interfere with the enjoyment of downstream owners. [74] Delegates unanimously concurred that riparian owners be allowed to dam the flow if it caused no injury to downstream interests. But because no federal laws existed concerning riparian rights, only archaic Georgia state laws, riparian conflicts continued in Columbus into the 1920's. [75] This unresolved legal matter added another dimension of uncertainty to the water power situation.

These many incidents led Baldwin to report that the electric power and light companies in Columbus had been giving "exceedingly bad service in Columbus for a long time" [76]. Since the bad service was due to the lack of river regulation, the service continued to be bad well after the consolidation in 1906. Baldwin claimed that the "irregular service" provided by the power interests "(caused) customers to invest in independent (electric) plants" [77]. This is effectively illustrated by the case of the Georgia Manufacturing Company.

The Georgia Manufacturing Company was "the first industry in Columbus to apply hydroelectric power to the operation of its plant; other manufacturers were still relying on steam for their power" when Georgia Manufacturing began buying power and light from the Brush Company at City Mills in 1897. [78] Six years later, in 1903, dissatisfied with the power service, the Georgia Manufacturing Company was one of the first hydroelectric power users to decide to install a steam engine and generators, and dispense with the central station service.

Other similar examples can be given from the Columbus experience. The Columbus Ledger-Enquirer, the daily newspaper, installed an isolated electric plant in December, 1904. As late as 1908 the Empire Mills Company opted to install a large steam power plant rather than buy Columbus Power Company service.

These decisions to install isolated plants were due not only to expectations of unreliability of the central station power but due to lack of primary capacity at North Highlands and City Mills. H. S. Reynolds, the Railroad Company manager, convinced the Home Mixture Guano Company to convert their plant from steam power to electric power. Capacity was then found lacking to accommodate a new customer, so the Guano Company, sold on electricity, installed its own isolated lighting plant and later an electric power plant. [79]

The factors which gave rise to the development of isolated plants were: bad service and lack of capacity to handle potential increase (but a stunted increase due to the isolated plants). The fact that both power developments were fully loaded made reliable service harder to maintain. By the end of 1904 Columbus Railroad Company's hydroelectric power station supplied about 11% of total power consumed in Columbus; Columbus Power Company 36%; isolated steam power plants 32% [80] (See Appendix I). Baldwin commented "this is unfortunate and I think it would be well to take it up with the Columbus Power Company to see whether we can't make some arrangement to prevent these independent plants which I consider a menace to the business of both companies." [81]

Yet conditions were not right to build a dam north of Columbus to regulate flow and increase power capacity. Foreseeable demand for central station power in the area would justify a new power dam; the cost of an impounding dam would not be offset by the increased revenues derived from the greater efficiencies of the existing stations; Stone and Webster were hesitating because of the uncertainties of the status of riparian rights laws in connection with a new dam. [82] Thus, an endless futile circle developed wherein the power companies and later the consolidated company would not build an impounding dam until demand picked up but demand would not pick up until a new dam was in the making. The great capital investment involved in a dam gave this circle unbroken. No solutions based on the needs of the community, using rational planning methods, were offered change the situation.

Competition: the Spur to River Development.

After the 1906 consolidation of the Columbus Power Company with the Baldwin power interests, the hydroelectric power business in Columbus was a monopoly. The Columbus Electric Company, holding the Columbus Railroad Company and the Gas Light Company of Columbus, and the Columbus Power Company were under the same management. [83] Competition, as already noted, had never been strong in Columbus due to the differing technological capabilities of the companies. After consolidation, the Columbus Railroad Company retired from actual power production, but continued to buy, sell, and distribute electricity generated by the Columbus Power Company.

Competition was therefore completely eliminated, and there seemed little danger of it in the future. The Power Company generated all the hydroelectric power and held riparian rights extending 11 miles upriver which included 44% of the fall of the Great Shoals of the Chattahoochee. [84] There was no immediate competitive pressure to develop power to the north.

The people of the city were irritated that the great water power potential of the area was not yet harnessed. The Ledger-Enquirer in 1905, expressed puzzlement as to why "capitalists" have bought up so much land on the river but "for some reason development has been delayed." In that year the president of the Columbus Board of Trade wrote to Stone and Webster that there was a "crying need for the development of more primary (guaranteed) electrical power, the absence of which is retarding the industrial progress of the city." [85]

The Columbus Power Company was not only playing "dog in the manger" with the undeveloped water power but worked hard at suppressing the growth of any alternative power sources. The existence of isolated electric plants mitigated the extent to which the Power Company could control the power market. They worked zealously to discourage these plants while offering no additional central capacity to fulfill the power needs of the city. Baldwin realized the value of absolute control of "the life blood of the community" [86] and did all he could to suppress any potential competition.

The city's annoyance with the power interests contributed to years of agitation for a municipal lighting plant. The Columbus Railroad along with the Baldwin-controlled (since 1902) Gas Light Company of Columbus provided the city's street and interior lighting. Mayor Chappel [87] first became interested in a municipally owned and operated lighting establishment late in 1902 when such operations were becoming fashionable. [88] Baldwin immediately acted to prevent any such establishment. He had Stone and Webster notify the General Electric Company that the Stone and Webster Group is "interested in Columbus and that they should avoid complicating the situation in Columbus should the Mayor (Chappell) ask their assistance." [89]

The municipal lighting question nevertheless intensified in 1904. Chappell, a man who generally got what he wanted, was using the possibility of a municipal plant as a threat: if the Railroad charged too much for light he would go ahead with the plant. [90] Although Baldwin felt the mayor was bluffing, he directed the local manager of the Railroad to bid on city lighting at a rate which was unprofitable to the company. [91] Chappell had for a time secured low rates for the city without construction of his municipal plant. In 1907 Chappell demanded an actual decrease of 29% in lighting rates. The city finally brought the rate question before the Georgia Railway Commission in 1908, while agitation for municipal lighting continued through 1909. [92]

Baldwin understood that complete control of the power market of a city had to be approached with tact. [93] He tried to ameliorate the municipality by offering free rides on the street railroad to firemen and policemen and by providing power free to the Secondary Industrial School. [94] Despite any efforts at reconciliation the City of Columbus sued the Columbus Railroad and the Gas Light Company of Columbus in mid 1909 for pursuing monopolistic price practices. [95] The Company successfully maintained that there was not a monopoly because any establishment could install an isolated electric plant. With lighting regulated by the Georgia Railroad Commission the city could no longer gripe about the lighting policies of the Company; but the fact that most of Columbus' most valuable asset was being wasted still angered the city and local commercial interests. [96]

In October, 1909, B. H. Hardaway, the Columbus contractor who built the City Mills and the North Highlands dams, organized the Chattahoochee Power Company. [97] The men involved in this company were Columbus businessmen who knew that if Columbus was to get moving it needed a new power development. The company began buying on the river in Harris County between the northern Columbus Power Company properties and West Point. [98] Hardaway felt strongly that developing the river above Columbus could stimulate demand in areas well beyond the city limits.

Acting instinctively, as it were, to suppress potential central power competition the Power Company began buying land and riparian rights in the area of Goat Rock (See Columbus Drawing 2) in an effort to block the possibility of Hardaway developing the land. [99] Hardaway agreed to sell his land to the Power Company if the Power Company agreed to build a regulatory dam and also to use Hardaway as the contractor for the project. [100] The Power Company had to accept the terms in order to sustain their valuable monopoly privilege and to maintain the image that they indeed had full planned control of the water powers of the Falls of the Chattahoochee. [101]

The decision to build the next upriver dam was not a result of a rationally devised plan for development of the river; nor was it a decision based on a sound economic rationale. It was simply a project they were forced to undertake in order to maintain their monopoly of the commercial power market and their control over future growth.

#### IV. EXPANSION AND INTERCONNECTION

The Columbus Power Company, beginning a major development at Goat Rock in 1909, still had to compensate for the fact that the conditions and attitudes which had so long discouraged such a project had not improved. Hardaway's bold move pressured the power company into protecting its control of the power market

by buying out the potential competition; the conditions Hardaway placed on the sale demanded immediate plans for dam construction. Unless the Columbus Power Company secured new customers, it faced the discouraging prospect of flooding its old market with an over-abundance of power. [102] The company therefore initiated an intensive campaign to build an industrial load for its new development. This would ultimately lead to the extension of the Columbus Power Company transmission lines into other cities and then to interconnection with the Georgia Railway and Power Company of Atlanta.

With construction of an impounding dam actually underway, the Columbus Power Company could hope to inspire the interest of potential customers, unattainable while the project was still no more than plans on paper. Work began on an impounding dam at Goat Rock in June, 1910. The company soon erected a cyclopean concrete dam to a height of 70 feet. By late 1911, one generating unit was in place, and the company was pushing the completion of a permanent power house and installation of another 3000 kilowatt generating unit. [103]

Selection of Goat Rock as the site of the long-planned impounding dam was important for several reasons. The steepness of the terrain and the narrow river channel compared favorably with the broad channel at Clapp's Factory which had so long interested Baldwin; it was a superior site for a power dam. [104] More important, the power possibilities of this development prompted the Columbus Power Company to turn its attention outward from Columbus to possible markets in other areas.

The construction of the Goat Rock development (WPD photos 10, 11, 12), therefore both necessitated and made possible pursuit of Hardaway's earlier admonition to build on the Chattahoochee with an eye to external markets. Long before completion of the impounding dam, Columbus Power had begun studying the marketing opportunities in West Point (30 miles north of Columbus), LaGrange, and points north. [105]

The Columbus Power Company's interest in West Point actually pre-dated its acquisition of Hardaway's holdings. The Columbus company was anxious to feed power into West Point's municipal system. Baldwin hoped that narrowing the power market above Columbus in this way would discourage investment in the Chattahoochee Power Company. [106]

Just prior to acquisition of all Goat Rock properties, Baldwin intensified his drive for northern markets. The company extended feelers toward West Point and LaGrange, sensing their potential markets. Shortly after the Hardaway deal the power company sent its findings to Stone and Webster. In both cities the Columbus Power Company might feed into municipally-owned lighting circuits. In and around the cities were cotton mills which the power company might interest in centrally-generated electricity. At LaGrange a street

railway company, recently granted a franchise, was a potential consumer. In LaGrange alone there existed the possibility of selling 9250 horsepower. [107] The orientation of the Power Company was well-expressed by Baldwin in a note to Stone and Webster in June, 1911. He urged completion of Goat Rock, articulating a "need to sell power to West Point, LaGrange, even North is far as Newnan. He did "not want to depend on increased power sale in Columbus. [108]

Baldwin's pessimism about the Columbus power market proved justified. [109] The establishment of the Meritas Mills (WPD photos 13 and 14) in Columbus in 1911, operating 9900 spindles, was undoubtedly related to the Goat Rock development, as construction of the Bibb and Columbus Manufacturing Mills had been related to the North Highlands development. More typical, however, of Columbus' hesitant power consumers was the Bibb Manufacturing Company. Despite the construction at Goat Rock, Bibb considered installing its own steam plant when planning its 1916 expansion, before deciding to rely on central station power. [110]

Although industrial demand for electric power expanded in Columbus, much of this was due to the gradually increasing requirements of already existing industries. [111] Meritas was the last important textile venture established in Columbus. No new major industries took root in the city.

Several factors contributed to this situation. Columbus was too far south to experience the southward migration of Northern textiles and industrial capital in the early twentieth century. The city was actually nearing the saturation point in the textile industry; local capital was unlikely to support more mills at Columbus. Finally, long-distance electrical transmission, the implications of which were recognized by the Columbus Power Company, eliminated the primary attraction Columbus offered to industry - proximity to the falls of the Chattahoochee River. Factories no longer needed to crowd the riverbanks; industry could locate far from Columbus while utilizing the water power along the city's shores.

The Columbus Power Company in effect turned its back on Columbus after construction of the Goat Rock dam. A 15-mile 11,000-volt transmission line from the dam to Columbus supplemented the city's power needs, but the company's attention and activities were primarily directed toward exploiting the power markets of other cities. By the end of 1911 the Board of Directors planned, and had allocated money for, a 66,000-volt line ultimately extending 83 miles to Newnan, Ga. They also planned 3 miles of 11,000-volt distribution feeders at West Point, and similar systems at Newnan and LaGrange. [112]

The company conducted load-building campaigns throughout construction of these lines. Baldwin found that many isolated plant operators remained convinced that they could generate power more cheaply than the power company could sell it. [113] Nonetheless, by 1913, when the Newnan sub-station was operating and ones at West Point and LaGrange were nearing completion, three mills took power from the Newnan distribution feeders.

The Columbus Power Company's drive to Newnan was, in part, an effort to secure new territory, developing markets along the transmission line. The Georgia Railway and Power Company (Atlanta) had considered developing a waterpower site near Newnan, but postponed it in order to develop its valuable property at Tallulah Falls. Columbus Power built toward Newnan so it could "occupy territory (The Atlanta company) would have had." Baldwin hoped that the Atlanta concern, to avoid wasteful competition, would abandon its Newnan plans, leaving the territory entirely open to Columbus Power. [114]

Underlying the northward expansion of the Columbus Power Company was the lure of a still more distant market - Atlanta. As early as 1907 Baldwin had recognized that recent developments in long distance transmission made Atlanta an attainable market. [115] Goat Rock developed power enough to justify approaching the Atlanta company with an offer. Baldwin wrote in June 1910 to P. S. Arkwright, president of the Georgia Railway and Power Company, that he planned to run transmission lines at least as far as LeGrange, and "could be in a position to supply almost any amount of electric current in Atlanta if it appeared to be profitable." Arkwright responded with interest, but without making a positive commitment. [116]

Baldwin's opinion was that "the ultimate destiny of the Georgia Railway and Power Company, the Central Georgia Power Company with ourselves will be to tie all of these water powers together and form a network of electric wires covering north and middle Georgia." The directors of the Columbus company nonetheless realized that the expense of a transmission line to Atlanta could not be justified without a profitable load from cities along the line. [117] The load-building campaign of the Columbus Power Company can therefore be seen, in part, as a stepping-stone to the Atlanta market.

The extension of a line to Newnan by the Georgia Railway and Power Company in 1912 raised the spectre of direct competition. Each company felt justified in claiming the territory. [118] The problem was soon resolved, however, by the interconnection of the two Newnan terminals, and an agreement for power exchange which satisfied both companies. [119]

Interconnection with the Georgia Railway and Power Company brought the Columbus company into a growing Southeastern interconnected system. [120] The increased reliability provided to participants in such a system, offering assurance to power provider and consumer alike, was a valuable asset to a company in expanding its business. The conditions allowing interconnection (e.g., expansion of small companies to nearby towns, construction of connecting lines through "virgin" territory) in turn insured that the power markets, and the companies supplying them, were less and less local in character.



Later Developments on the Falls of the Chattahoochee

In 1922 a merger between the Columbus Railroad company and the Columbus Power Company, long controlled by the same interests, formed the Columbus Electric and Power Company. At this time 33 mills received power from the company; the large load required purchase of large amounts of power from one major southern power companies. The Columbus company keenly felt the need for additional hydroelectric capacity of its own. [121]

The Columbus Electric and Power Company developed the Bartlett's Ferry dam 4 miles above Goat Rock between 1924 and 1928 (WPD photo 15 ). This provided 80,000 kilowatts to the company's transmission system. The development was the last at the Falls for 35 years. [122]

The Columbus Electric and Power Company merged in 1930 with the Georgia Power Company. In November, 1959 this company completed final hydroelectric development at the Falls of the Chattahoochee. Oliver Dam occupies the Clapp's Factory site which the Columbus Power Company failed to develop many years before. The dam, with a 70 foot head developing 65,000 kilowatts, typified the modern hydroelectric plant (WPD photos 16, 17, 18) serving not a limited area but a system into which its power is fed and directed where needed [123] (WPD photo 19).

Conclusion

The water power development at Columbus, reflecting the needs of the different eras during which they were constructed, can be traced through the dams now standing on the Falls of the Chattahoochee (Drawing 2). Wooden mill dams gave way to larger, more efficient stone dams. The City Mills dam and, to a much greater extent, the Eagle and Phenix dam still provide power to the companies they were originally built to serve. The intensive utilization of the Chattahoochee, combined with the river's erratic flow, resulted in later attempts to regulate river flow and provide a steady power supply using more sophisticated generation and transmission technology.

The history of hydroelectric developments at Columbus reveals that it was primarily commercial considerations which prompted decisions to use the new technology to advantage. Not until its monopoly was threatened by the Chattahoochee Power Company did the Columbus Power Company build the Goat Rock dam. Once constructed, the Power Company could develop markets along its transmission lines, expanding far beyond its original role as local power producer (WPD photo 20).

The large Goat Rock, Bartlett's Ferry and Oliver Dams represent the efforts to combine regulation with power production on the Chattahoochee. These developments, prompting Columbusites to bill their town as the "Electric City" in the 1920s, served large regional power systems. [124] The dams, while ironically improving flow to the stations below, also served to diminish the importance of the lower Columbus power sites. The interconnected network served by the large dams tended to draw industrial investment away from the riverbanks, away from Columbus' old industrial center (WPD photo 21). This factor has undoubtedly contributed to the preservation of the nineteenth century river profile at the city of Columbus.

Footnotes

1. Nancy Telfair, A History of Columbus, Georgia, 1828-1928 (Columbus, 1929), 23.
2. Columbus Enquirer, 19 October 1841.
3. See Columbus Magazine IV, 4 (September 30, 1943); the entire issue is devoted to steamboats on the Chattahoochee.
4. 36th Annual Report of the Railroad Commission of Georgia, 1908, 25, Georgia Department of History and Archives, Atlanta.
5. American State Papers, Military Affairs, IV, 480.
6. 1840's Map, Columbus College Archives.
7. John H. Martin, Compiler, Columbus Georgia, From Its Selection as a Trading Town in 1827 to Its Partial Destruction by Wilson's Raid in 1865 (Columbus, 1874), I, 96, II, 36; Telfair, Columbus, 67; Columbus Daily Enquirer, 18 August 1871.
8. See the HAER report on the Development of the Augusta Canal. Summer, 1977.
9. Martin, Columbus, I, 119, 127-28, 138, 147, 157-58; Proceeding of Eagle and Phenix Mills vs. Muscogee Manufacturing Company, filed May Term, 1905 and Decree issued in May Term 1909, Muscogee County Superior Court (this relates to the development of water power during the antebellum period). Columbus Enquirer, 13 October 1841; statement of money spent on dam, canal, and factory, dated 1 January 1845, signed by John M. Howard, Farish Carter Papers, Southern Historical Collection, University of North Carolina at Chapel Hill; Scientific American, 29 June 1850, 322.
10. Hunt's Merchants Magazine, August 1850, 247; Deed Book C, 618, Muscogee County Court House; Richard Griffin and Harold S. Wilson, "The Antebellum Textile Industry of Georgia," (Unpublished Manuscript) 151-52.
11. The Columbus Enquirer, quoted in Martin, Columbus, I, 149, 157-58; Augusta Chronicle and Sentinel, 8 March and 3 May 1845. Other newspapers reported with less enthusiasm on the industrialization in Columbus. The Athens Southern Banner, a Democratic organ, objected to the Lowellization of Columbus since it meant the town would be a Whip stronghold (9 November 1848).
12. Letter from John Baird to Farish Carter, September, 1845, deed to a share of Lot #1, 1 April 1845, Farish Carter Papers, UNC; Griffin, "Antebellum Textile Industry of Georgia." 153-54; Hunt's Merchant Magazine (August, 1850), 247.

13. Letter from Walter T. Colquitt to Farish Carter, 31 January 1851, letters from John Baird to Farish Carter, 22 April 1851, 20 June 1851; Farish Carter Papers, UNC; Proceedings of Eagle and Phenix vs. Muscogee Manufacturing Company; Allen H. Stokes, "From Slavery to Jim Crow: Black Labor in the Southern Textile Industry, 1885-1914" (Ph.D. dissertation: University of South Carolina, 1977), chapter II.
14. Martin, II, 36, 75, 76; Columbus Enquirer, 7 June 1853; Scientific American (29 June 1850), 322. Winter also owned a paper factory located on an island north of the city.
15. Letters from John Baird to Farnish Carter, 5 August and 1 June 1851, Farish Carter Papers, UNC. Other references to high water or broken dams include Martin, I, 118, 128, II, 59, 67; letters from Baird to Carter, 16 August 1845, 22 April, 25 May, 1 June, 20 June, 5 August 1851, Walter T. Carter to Carter, 31 January 1851, L. M. Carter (son) to Farish Carter, 5 February 1853, Farish Carter Papers, UNC.
16. Letter from Baird to Carter, 17 June, 1850, 1 June, 20 June, 5 August 1851, from Colquitt to Carter, 15 March 1851, from R.M. Gunby to Carter, 30 July 1853, Farish Carter Papers, UNC; "Eagle and Phenix River Development," (typescript, 3 February 1964) Eagle and Phenix Company Records (hereafter cited as EOCR); E.H. Hinton, "A Historical Sketch of the Evolution of Trade and Transportation at Columbus, Georgia", (typescript, 1912), 34-35.
17. Chesterfield County, Virginia was the only county with a larger production in 1860. See the appropriate states in Eighth Census, 1860, Manufactures of the United States in 1860, Table I, Manufacturers by Counties.
18. I. W. Avery, The History of the State of Georgia, From 1850 to 1881 (New York, 1881), 297; Diffie William Standard Columbus, Georgia, in the Confederacy, the Social and Industrial Life of the Chattahoochee River Port (New York, 1954), 27-35.
19. Standard, 59-62; James P. Jones, "Wilson's Raiders Reach Georgia: The Fall of Columbus, 1865", Georgian Historical Quarterly, LIX (Fall, 1975), 313-29).
20. John S. Lupold, "The Industrial Reconstruction of Columbus, Georgia, 1865-1881", (paper read at the Georgia Historical Socieity meeting, October 1975).
21. The new dam used 8100 cubic yeards of masonry weighing 20,229 tons and 103,250 square feet of yellow pine. Annual Report to the Stockholders of the Eagle and Phenix Manufacturing Company for the Year 1869, 1870, 1872, 1882, 1883, and 1885; "Eagle and Phenix Mills Centennial", (typescript), EPCR; Columbus Daily Enquirer, 14 September 1869.

22. Columbus Sun, 12 March 1870; Columbus Daily Enquirer, 21 September 1871.
23. The 1880 Census rated the amount of water (horsepower per square mile) used in every county in the U.S. on a scale of one to six in ascending order. Muscogee was the only county south of New York state to rank a "five" (15 to 30 horsepower per square mile). The only "sixes" (over 30 horsepower per square mile) appeared in Massachusetts and Connecticut. Herman Hollerith, "Statistics of Power Used in Manufacturing", in Tenth Census, 1880, Manufactures Map XL0. 2, facing p. 6.
24. Lupold, "Industrial Reconstruction of Columbus", 10-11; Telfair, Columbus, 133; Stevens and Wright, Georgia, History and Industry, p. 337-38.
25. Eagle and Phenix Mills vs. Muscogee Manufacturing Company, Filed to the Court, May Term 1905, Decree issued, May Term 1909, Muscogee County Superior Court.
26. B.M. Hall & C.C. Anderson, Water Powers of Georgia, Geological Survey of Georgia (W.S. Yeats, State Geologist), Bulletin Number 3-A "A Preliminary Report", 1896, page 9-10.
27. The largest was Tallulah Falls with 335 feet of fall (developed 1910-1914); the next was the "Great Amicolala Shoals" in Dawson county with 234 feet of fall.  
The Great Shoals of the Chattahoochee is a stretch of 11.4 miles which begins at what is now the Goat Rock dam and ends at the base of the Eagle and Phenix dam. This survey information from B.M. Hall & M.R. Hall, Second Report on the Water Powers of Georgia, Geological Survey of Georgia (S.W. McCallie, State Geologist), Bulletin No. 16, 1908, pp. 302-313.
28. Passer, Harold C., The Electrical Manufacturers 1875-1900, Cambridge 1953, 19. The Brush Electric Company controlled 80% of the arc lighting market 1878-1880. By 1880 5,000 Brush arc lamps were in use.
29. J. Rhodes Browne, George P. Swift, W. Riley Brown, W.A. Swift, G.M. Williams. G.P. Swift was owner (and founder) of the Muscogee Manufacturing Company. From petition for incorporation of the Brush Electric Light and Power Company filed 2 March 1882 in the Superior Court of Muscogee County.
30. The Brush Electric Company organized similar affiliates in major cities across America. The standard procedure was for a Brush Electric Company representative to enlist capital within the city to form a local arc light company. The local company agreed to sell, use, and rent equipment manufactured by the Brush Electric Company. The Cleveland firm received 32-48% of the capital stock of each local affiliate. All Brush affiliates entered the street lighting business.

31. W.F. Borleau, Electrical Equipment of a Southern City," Electrical World, (E.W.) 30 (4 September 1897), 275-278; The Industries of Columbus, GA; Her Advantages as a Business Center, Manufacturing Locality and Healthful Habitation pamphlet, Columbus, Ga., 1887 (Wm. Gilbert, Printer).
32. Suit in Superior Court of Muscogee County: Phillip H. Ellison vs. Brush Electric Light and Power Company, filed 6 October 1892; Borleau, E.W. 30 (4 September 1897).
33. Columbus Electric Company incorporated 14 October 1887 by T.E. Blanchard, Ammy Dexter, William C. Clark, D.F. Willcox, E.H. Jenkins, filed in Superior Court of Muscogee County.
34. Chattahoochee Falls Company -- "The Best Water Power in the Southern States - A rare chance for investment" - 1887, pamphlet in the Special Collection of the University of Georgia. The Clapps Factory was built in 1867, improved 1877 and stopped operation in the 1880's. It stood at the site of the Oliver Dam. The factory burned in 1910.
35. In 1882 there was a log dam which extended from the shore to an island midstream. This simple dam diverted water to the cotton mill and grist mill. Agricultural Review and Journal of the American Agricultural Association, (January, 1882), quoted in pamphlet, note 34.
36. The Stone and Webster group in Boston took notice of this site in 1901; but ironically it would be the last site developed on the Great Shoals of the Chattahoochee. Oliver Dam was completed there in 1960.
37. Minutes of Board of Directors meeting, City Mills Co., 18 September 1894, City Mills Co. Records; City Mills vs. Columbus Railroad Co., Muscogee County Superior Court, Records of Write, 29 January 1898.
38. Telfair, Nancy, A History of Columbus, Georgia 1828-1928; The Columbus Power Company was organized in 1897. H.M. Comer was president, G.G. Jordan--treasurer; both were Bibb Manufacturing Company directors. H. Pittman, "People, Progress, and Plants." manuscript in Bibb Company files, Macon, Georgia.
39. In order to build the hydroelectric station at the City Mills dam in 1894, the Columbus Railroad Company had to mortgage its property to the contractors, Drake and Stratton Company of Philadelphia. This group did not actively participate in the operations of the Railroad. Columbus Railroad Records, 11 August 1894 in Georgia Power Company file, Atlanta, Georgia.
40. Stone and Webster was a holding company and an engineering consulting firm. In 1899 they held 11 electric power companies. Most were combined electric power and light, electric railway operations like that of the Columbus Railroad Company.

41. George J. Baldwin letter to Joseph P. Gray, 16 November 1903, George J. Baldwin Papers (Columbus files), Southern Historical Collection, University of North Carolina at Chapel Hill. All Baldwin correspondence below is from this collection, unless otherwise noted.
42. Baldwin to John Flournoy, 31 December 1900, Baldwin to Stone and Webster, 28 December 1899.
43. Stone and Webster to Baldwin, 21 June 1901.
44. Baldwin to Major J.F. Hanson, 27 December 1899. What he suggested specifically was for the Columbus Power Company "to make a wholesale customer of the Railroad". This letter was marked "strictly confidential."
45. Hanson to Baldwin, 25 July 1901. The bitter and ruinous competition between the Georgia Electric Light Company of H.M. Atkinson and the Atlanta Railway Company of Joel Hurt in Atlanta may have effected the thinking of Baldwin and Hanson. The two Atlanta competitors merged in 1902. For a discussion of this merger see Barbara A. Kimmelman "The Georgia Power Company: The Early Decades" unpublished term paper, fall 1976, University of Pennsylvania, History and Sociology of Science.
46. In 1901 the Columbus Railroad sold large amounts of electricity (100-200 horsepower) to the Muscogee Manufacturing Company, the Georgia Manufacturing Company, the Springer Brothers who operated the Opera House, and the City of Columbus.
47. Flournoy to Baldwin, 5 June 1905.
48. (Baldwin to Flournoy correspondence, June 1901. Baldwin directed operations of the Columbus Railroad from his office in Savannah. Flournoy, a prominent Columbus developer, saw that Baldwin's directions were carried out).
49. Stone and Webster to Baldwin, 13 June 1901, "It will be unfortunate if we cannot find some customers for power, for the cost of development (of Chattahoochee Falls Company water power) seems to us to work out at a very low figure, and it would be a pity not to be able to take advantage of so favorable a source for the power that we shall need for the lighting and railway business".
50. Hanson to Baldwin 18 December 1901.
51. The "freshet" occurred 29 December 1901. The dam continued to crumble through 2 January 1902. See B.H. Hardaway, "Failure of Dams Near Anderson and Columbus," Columbus Enquirer-Sun 4 January 1902, also B.H. Hardaway, "Remarks on Recent Failures of Masonry Dams in the South," Engineering News 47 (6 January 1902), 107-109.

52. The contract of 1 July 1902 specified that the Chattahoochee Falls Company was to build a dam with 43,200,000 cubic feet of pondage. Water was to be impounded at night and released at the rate of 2,000 cubic feet per second during the day. This would provide the Columbus Power Company with 7,300 horsepower\* (much more than they could then utilize -- 4341.6 could be used at the upper power house, and 1500 horsepower was used by Bibb at the lower power house in 1902). \*HP= flow x head x .0895=2000 x 41 x .0895. Columbus Power Company agreed to sell only to users of more than 75 electric horsepower; the Chattahoochee Falls Company would have the smaller clients. The Chattahoochee Falls Company was restricted from hydroelectrically developing the proposed impounding dam until 6500 horsepower of unsatisfied demand was manifest in the Columbus area. The contract also provided that:  
The Columbus Power Company would supply up to 1300 horsepower (746 watts = 1 horsepower) to the Chattahoochee Falls Company to sell to small users and for lighting.  
At low water the minimum flow was to be maintained at not less than 1000 cubic feet of water per second.  
Contract signed 1 July 1902 (copy in Baldwin Papers, SHC, UNC).
53. The Goat Rock dam was completed in 1911.
54. Baldwin purposely had the City Mills station shut down the surplus wheels in order to become a substantial power customer of the Columbus Power Company.
55. The Gas Light Company of Columbus was chartered 18 February 1854. The transaction was, in fact, a clandestine one. Even as the transfer was nearly settled, Baldwin's manager of the Columbus Railroad, H.S. Reynolds, did not know that Baldwin was even interested in the Gas Light Company. It happened that bidding for Columbus street and interior lighting contracts was to be held at the time the transaction was taking place (December, 1902). In the past, of course, the Railroad and the Gas Light Company were competitive bidders. Baldwin instructed Reynolds not to bid too low for municipal contracts when bidding against the Gas Light Company for an area. Reynolds questioned this; he was instructed to do as he was told. The transaction was kept away from the newspapers as long as possible by having Mr. Manning White, a clerk in Baldwin's Savannah office, sign the transaction (Baldwin to Stone and Webster, 7 January 1903).
56. In his investigations of the Gas Light Company, Baldwin discovered that gas customers who were in arrears and were disconnected for gas service would quickly subscribe to the Railroad for electric light service. Often they did not pay their electric bill either. Reynolds gave an example as to how he handles the situation: he accepted as a customer a "colored church" which had been cut off from Gas Light Company service. The church used kerosene lamps for a while then petitioned the Railroad for service. Reynolds took 3 months contract service rate in advance before the lights were installed. (Baldwin to Reynolds, 29 December 1902); Reynolds to Baldwin 5 January 1903.

57. Baldwin to Stone and Webster, 7 January 1903.
58. Columbus Electric Company was chartered in the state of Maine, 5 February 1903, Records held by Georgia Power Company, Atlanta.
59. Baldwin to Flournoy 26 February 1903.
60. Reynolds to Baldwin 2 February 1903, Ibid. In 1903 the Columbus Power Company sold power as follows:
- |                                   | Electrical Horsepower |
|-----------------------------------|-----------------------|
| Swift Mill                        | 500                   |
| Hamburger                         | 250                   |
| Electric Light for Hamburger Mill | 100                   |
| Columbus Manufacturing Company    | 1,200                 |
| Columbus Railroad Company         | 200 secondary power   |
| Muscogee Mill                     | 400 secondary power   |
61. Stone and Webster to Baldwin, 10 February 1904.
62. Hanson to Baldwin, 26 November 1904.
63. Baldwin to Stone and Webster, 14 December 1904. In 1904 the Power Company installed 2 generators in the upper power house increasing their capacity by 2/3. Their power production, however, did not increase to that proportion due to the poor water flow.
64. Baldwin to Stone and Webster, plus letters written on 14 December 1904 to G. Gunby Jordan, E. W. Swift, G. A. Pearce, of the Eagle and Phenix, Muscogee Mills, and City Mills respectively. The action was suggested by Hanson who thought that instead of the Columbus Power Company-Chattahoochee Falls Company consolidation a consolidation of all power interests in and around Columbus would be best. This is, of course, what Baldwin had wanted -- but his interests were primarily in the larger, undeveloped areas north of Columbus. Hanson said "it will be difficult to accomplish anything with City Mills and Muscogee Mills people as the presidents of both of these companies are people of very narrow view"; Baldwin agreed. Hanson characterized G. Gunby Jordan, a board member of the Bibb Manufacturing Company, as a "very broad minded man". Jordan answered Baldwin's solicitation by stating that he had more than enough water power at the Eagle and Phenix dam than he needed (Jordan to Baldwin, 15 December 1904). Pearce at City Mills opposed the impounding dam because he ran the mill at night.



65. The load the Railroad presented to the Power Company generators varied widely from minute to minute as the street cars accelerated and decelerated. Charges to the railway were calculated by reading a recording ammeter on the Railroad feeder and multiplying this number by the voltage of the power service. The number which resulted was not a good measure of power consumed because it included "wattless" current. Because the local voltage and load current were not in phase, the power factor was less than 1. This apparent load heated the coils of the generator as would an actual load of that magnitude but required no power from the turbine. Since the generators could produce only so many volt-amps the power company wanted to charge the Railroad as if the power they received was watts. Since the load did not require that much power from the turbine, the Railroad wanted to pay only for watts received (volt-amps divided by watts gives power factor which is the cosine of the phase angle between load voltage and current).
66. The Railroad had been cut off without Hanson's knowledge. He restored the interconnection a few weeks later.
67. Pittman, "People, Progress, and Plants," p. 26. The Bibb Company took \$750,000.00 cash and \$25,000.00 in Columbia Improvement Company promissary notes which were guaranteed by the Columbus Electric Company. The Columbia Improvement Company was a Stone and Webster transfer entity.
68. Charter of the Columbus Power Company, March 1906, Bibb Company records, Macon, Georgia; Jordan's remarks were made during a speech on 5 March 1906 at a banquet of state congressmen.
69. G.A. Pearce of City Mills, Report of the President, 21 October 1907, City Mills Records.
70. Reynolds to Baldwin, 20 September 1901.
71. Baldwin to Stone and Webster, 16 May 1904.
72. Stone and Webster to Baldwin, 31 June 1904. In fact Stone and Webster directed that the Chattahoochee Falls Company dam not be constructed until the effect of the Morgan Falls Dam on the river flow in Columbus could be ascertained.
73. Baldwin to G. Gunby Jordan, 14 November 1904; the meeting of Columbus businessmen was held 13 December 1904 (Baldwin to Stone and Webster, 14 December, 1904). Gainesville is on the Chattahoochee in Hall County, Georgia, northeast of Atlanta.
74. Baldwin claimed that the municipality of Atlanta diverted enough water from the river to cause a decrease in flow to Columbus which decreased the power available 2 1/2 horsepower per foot of fall. According to B. M. Halls survey of the Chattahoochee Falls Company done in 1902 there was an average power potential of 125 horsepower available per foot of fall in Columbus. Baldwin to Stone and Webster, 14 December 1904.

75. Minutes of the May, 1905 meeting Eagle and Phenix Company records, Columbus, Georgia. While regulation of stream flow is essential for the hydroelectric development of a river, an adequate water flow for a hydroelectric plant is not always enough for navigation. The Tri-state Navigation Company complained in 1923 to the Columbus Electric and Power Company that "unless full flow of the river is continued through the power dams, it will wreck this company" (19 February 1923, copy in Baldwin Papers, SHC, UNC).
76. Baldwin to Stone and Webster, 14 December 1904.
77. Baldwin to Reynolds, 26 February 1903.
78. Telfair, Columbus, 1828-1928, p. 196. In 1889 electric lighting users were as follows (gathered from Sanborn Insurance map dated 1889):
- |                                |   |
|--------------------------------|---|
| Columbus Iron Works            | incandescent light from isolated steam plant          |
| Georgia Manufacturing Company  | arc and incandescent service from Brush               |
| Eagle and Phenix               | arc and incandescent lights from isolated hydro plant |
| Muscogee Manufacturing Company | isolated hydro plant for incandescent lights          |
| Muscogee Oil Mills             | 50-light incandescent isolated steam driven dynamo    |
| Paragon Mills                  | arc light service from Brush                          |
| Swift Mill                     | Edison 450-light incandescent dynamo (run by steam)   |
79. Reynolds to Baldwin, 18 February 1903, 12 March 1903. The Columbus Railroad had maintained a steam auxiliary since it acquired the North Highlands Railroad in 1898, but it was of very small capacity; a month in 1904 it provided only 670 horsepower of 11,304 horsepower used by the railroad. Reynolds to Baldwin, 12 May 1904. Even with steam power, reliability is not assured. In July 1902 when water was very low and the Power Company was still running very much below capacity due to dam reconstruction the Columbus Railroad ran out of coal for its steam auxiliary. There was a coal shortage in Columbus due to a strike in Birmingham, Alabama.
80. Summary of Power in Columbus, Report to Stone and Webster, 19 December 1904, See Appendix I for horsepower supplied to major Columbus industries from various sources, by company.

81. Baldwin to Reynolds, 30 January 1903. In a letter to Hanson of the Power Company, Baldwin commented, "We are able to practically prevent it (isolated electric plants) in Savannah where we use steam and between us we should certainly be able to prevent it in Columbus".
82. Eagle and Phenix, City Mills, and downstream navigation interests were opposed to the dam project on the Chattahoochee Falls Company property. Correspondence, Bladwin and Stone and Webster, 1901-1906.
83. W.C. Bradley, G. Gunby Jordan, F.B. Gordon, and A. Illges were the local men in the Columbus Electric Company. They were from Eagle and Phenix and others, Bibb & Eagle and Phenix, etc., Columbus Manufacturing Company, Goldens' Foundry and City Mills, respectively.
84. The Coweta Power Company, along with the Chattahoochee Falls Company, was a land and riparian rights holding company run by Baldwin and others since 1901. The land held by the company gave "continuous riparian ownership on the Georgia side from some 8-10 miles above Standing Boy Creek", which was the northern boundary of the Chattahoochee Falls Company. B.M. Hall, the expert hydrographer of Georgia, called this holding "by long odds the most valuable and biggest undeveloped water power in the South". Columbus Electric Company records June, 1905, 22 February 1906, held in Georgia Power Company files, Atlanta, Georgia; also Flournoy to Baldwin, 30 December 1903.
85. Columbus Ledger-Enquirer, 6 December 1905; J. Ralston Cargill (Columbus Board of Trade) to Stone and Webster, 4 October 1905. Cargill wrote:
- Columbus is in an embarrassing situation, the Board of Trade and the papers are always blowing the horn about Columbus water power and since that power as is not even adequate for present industries . . .
- John Flournoy had written Bladwin, 17 July 1905:
- . . . the opinion of the town is that if the owners of power sites aren't going to develop that water power they should get out of the way and let others do so.
86. Baldwin to Stone and Webster, 19 March 1909 (see note 93 for full quote).
87. L.H. Chappell held the office of mayor of Columbus 1897-1907 and 1911-1913.
88. Numbers of municipal lighting establishments:

1902	815
1907	1252
1912	1562
1917	2318

Percentage of all central stations which were municipally owned:

1902	22.5%
1907	26.6
1912	29.9
1917	35.4

Percentage of kilowatt-hours produced by municipal light and power stations compared to total:

1902	7.8%
1907	4.9
1912	4.6
1917	4.0

Data from Census of Electric Industries, 1922; Central Electric Light and Power Stations (GPO, 1925) in North Carolina Collection at University of North Carolina, Chapel Hill.

90. Chappell to Baldwin, January 1904. "I shall advocate the installation of a municipal plant if any advance in rate is made. In my opinion the city should own its lighting as well as its system." An anecdotal example of how Mayor Chappell operated is provided by this incident of 1 December 1904: The Railroad laid new track on the west side of Broad Street which was apparently too close to the city firehouse. Mayor Chappell first wrote Reynolds to move the tracks far enough from the station so that fire trucks could park between the track and the curb. Reynolds did not act so Mayor Chappell ordered the fire chief to park one fire engine on the street railway tracks. This stopped the railroad cars. Reynolds "ran" down to the mayor's office, held a short conference, and promptly had the tracks removed. Incident reported in the Columbus Ledger-Enquirer, 1 December 1904.
91. Baldwin to Reynolds, 21 December 1902; Baldwin to Reynolds, 23 January 1904, "Chappell is a great bluffer and I hardly think he will be able to raise funds with which to pay for a lighting plant."
92. Baldwin to J.S. Bleeker (manager of the Columbus Railroad), 26 March 1908. The outcome of the case was that the Railroad was required to lower rates slightly, P.S. Arkwright (Georgia Railway and Electric Company) to Baldwin, 3 November 1909.
93. Baldwin to Stone and Webster, 19 March 1909:

Mr. Flournoy thinks that more and more people in Columbus are believing that our company (Columbus Power Company and Columbus Electric Company), having complete control of the water power situation is intentionally taking advantage of it. That we are not living up to our contract with the City Mills Company and that we are endeavoring to force matters generally. All of which is a bad frame of mind for people to get into . . .

It is, of course, evident that when we have such complete control of the life blood of any community as we do in Columbus, this control must be exercised with the very wisest discretion and the utmost moderation. The bigger the weight you put on a safety valve, the greater the explosion when it comes.

94. Baldwin also had other reasons to help such an establishment. Baldwin to Stone and Webster, 5 January 1903. The Power Company also gave the school a \$10,000 grant in 1907:

If every child in Columbus is trained by the public school authorities in the belief that steam is obsolete, that electric power is the thing, . . . you will find that 5 or 10 years hence no factory of any kind in Columbus can run by steam; that every workman in it will demand electric power because he has been taught throughout his childhood that this is the proper thing.

Baldwin to F.E. Reidhead (manager of the Columbus Railroad), 9 February 1907. The gift was announced in the Columbus Enquirer-Sun, 24 February 1907.

95. Suit filed in Muscogee County Superior Court, 12 May 1909.
96. See footnotes 93 and 86.
97. Chattahoochee Power Company chartered by B.H. Hardaway, T.A. Jamison, C.A. Pearce (City Mills Company), R.W. Weedhen, E.J. Davidson, R.M. Norman, R.A. Carson, John P. Illges (Coldens' Foundry) filed in Muscogee County Superior Court, October 1909.
98. Much of the capital of the Chattahoochee Power Company was City Mills Company money. The relation between the City Mills Company and the Power Company had always been rather tenuous (see HAER reports for these companies). In fact the City Mills Company had sued the Columbus Power Company for surplus power charges and monopoly practices in 1909 (City Mills Company vs. the Columbus Railroad Company and the Columbus Power Company, May, 1909). It is appropriate that the threat to the Power Company came from their direction. On 3 November 1909, Hardaway sent Baldwin an ominous memorandum. Hardaway advised the Power Company to build a large power plant to supply West Point and to run a line from Newnan to Atlanta. He emphasized "develop the Chattahoochee. Don't wait", almost as if teasing the Power Company with the threat of competition if nothing was done.
99. Bleeker of Columbus Power Company to Stone and Webster, 24 September 1909. News that Hardaway was going to start buying land reached the Power Company at this time. Purchases of land at Goat Rock were to be arranged immediately.

100. The Power Company had started to make plans to develop Goat Rock in January, 1910. They had already contract ed Thomas Reed to build the dam which was to be a power development. Hardaway froced the Power Company to change its plans. Director's Reports; Columbus Electric Company, 18 January 1910.
101. Hardaway received \$75,000 cash and \$30,000 in Columbus Power Company stock in exchange for some 6 miles of river property. He received the building contract in addition. 22 February, 1910 (copy of agreement in Baldwin Papers, SHC, UNC).
102. Such a prospect could prove fatal to a hydroelectric venture. The fixed cost of such projects was great; if the ultimate connected load could not compensate for the high initial investment, chances ofr a money making project were gloomy.
103. D.H. Braymer, "The Generating System of the Columbus Power Company, Columbus, Georgia", Electrical Engineering (E.E.) (June 1913), 247-254. This article gives technical details on the Goat Rock development.
104. Ibid.
105. In addition to Hardaway's hinting, the experience of the Stone and Webster Corporation, holder and manager of many power companies during this period of geographic expansion of urban-centered companies, would provide valuable assistance to the Columbus company's venture.
106. Columbus Power to Stone and Webster, 11 January 1910, Baldwin Papers, SHC, UNC.
107. Columbus Power to G.F. Baldwin, 6 February 1910, Report to Stone and Webster, March 1910 (copy of report in Baldwin Papers, SHC, UNC).
108. Correspondence between Baldwin and Stone and Webster, June 1911.
109. Earlier efforts to draw new industry to Columbus had met with little success. The power company's unreliability and procrastination had turned away outside capital interested in textile mills (G. Gunby Jordan to Baldwin, 7 July 1908).
110. Nancy Telfair, A History of Columbus, Georgia, 1828-1928, Columbus, 1929, p. 251; Henry Pittman manuscript, "The Bibb: People, Progress, and Plants", p. 70, Bibb Company Records (BCR), Macon.
111. Telfair states that the Bibb, Meritas, Muscogee, Bradley, and Perkins Hosiery Mills increased facilities and output between 1911-1928; she also states that new industries located in Columbus, but fails to cite any (299-300).

112. Minutes, Special Directors Meeting, 14 December 1911, Columbus Power Company, Georgia Power Company Records, Atlanta; Braymer, "The Generating System of the Columbus Power Company . . ." E.E., 1913, 252-253. This line was originally intended to carry 11,000 volts; by 1915 it carried 66,000.
113. J.S. Bleecker to Baldwin, 2 July 1912. In 1914 Baldwin, apparently seeking to bolster his arguments with such manufacturers, contacted General Electric for "official" information on the savings and benefits of centrally generated power (Baldwin to General Electric, 7 February 1914).
114. Baldwin to Stone and Webster, 11 March 1911.
115. Baldwin to Stone and Webster, 15 May 1907.
116. Baldwin to P. S. Arkwright (president, Georgia Power Company), 8 June 1910, J.S. Bleecker to Charles F. Wallace (Stone and Webster), 25 July 1910.
117. Columbus Power Company to C.F. Wallace, 23 March 1911; C.F. Wallace to Baldwin, 21 March 1911.
118. H.H. Dean to Baldwin, 22 May 1911; Stone and Webster to Baldwin, 31 July 1912.
119. Wade H. Wright, History of the Georgia Power Company, 1855-1956, Atlanta, 1957, 145. Columbus received power during the daytime to help it through the industrial peak, and delivered to Atlanta at night and on weekends when its own load dropped greatly.
120. "Interconnected Systems of the South", E.W. 63 (30 May 1914), 1235-1243.
121. E.W. 81 (3 May 1923), 534; Special Director's Meeting, 6 March 1922, Columbus Power Company Records, at Georgia Power Company files, Atlanta.
122. Director's Meeting, 7 March 1924, Columbus Railway and Electric Company Records, at Georgia Power Company, Atlanta; H.A. Hageman and T.B. Parker, "The Bartlett's Ferry Hydroelectric Development", Journal of the Boston Society of Civil Engineers 13 (March, 1926), 93-125. This article gives technical information about the development in exhaustive detail. Once again, the dam was constructed by B.H. Hardaway.
123. Industrial Index 53 (22 April 1959), 33rd Annual Columbus Number; copy of construction timeline of dams operated by the Georgia Power Company on the Chattahoochee near Columbus, obtained from Georgia Power Company office, Columbus, Georgia.
124. "The Electric City", Columbus Board of Trade pamphlet, circa 1920s.

Appendix I: Power produced in Columbus (by power source) and breakdown into individual companies. From Summary of Power in Columbus, Report to Stone and Webster, 19 December 1904.

Total Coal - Steam	2280 horsepower
Total Coal - Electricity (isolated plants)	1000 horsepower
Total Wood Shavings - Steam	615 horsepower
Total Water	
Columbus Railroad Company	1390
Columbus Power Company	4500
Isolated hydroelectric	2300
Total	12,250 horsepower

This was broken down into companies by H.H. Hunt for H.G. Bradlee of Stone and Webster on 5 May 1904, as follows:

Golden's Foundry and Machine Company	
Isolated electric plant operated by steam (coal) using D.C. current	200 horsepower
Atlanta Compress	
Steam power (coal)	400 "
Columbus Barrel Factory	
Steam from shaving	125 "
Hamburger Cotton Mills	
Electricity from Columbus Power Co.	300 "
Swift Manufacturing Company	
Electricity from Columbus Power Co.	600 "
City Mills Company	
Water power	500 "
Columbus Railroad Company	
Railway, light, and power service	1200 "
Water power	500 "
from Columbus Power Company	200 "
from Steam plant	500 "
Columbus Water Works Company	
Steam from coal	75 "
Muscogee Manufacturing Company	
Electricity from Columbus Power Company and water power	650 "



Georgia Manufacturing Company	
Electricity from Columbus Power Company	200 "
from Columbus Railroad Company	45 "
Eagle and Phenix	
Electricity from water power	2000 "
Girard Cotton Mill	
(Electricity from Eagle & Phenix)	300 "
Columbus Iron Works	
D.C. Electricity from isolated steam plant (coal)	300 "
Empire Mills	
Electricity from Columbus Railroad Company	20 horsepower
Steam power (not electricity)	350 "
Southern Cotton Oil Company	
Steam power from coal	125 "
Home Mixture Guano Company	
Steam power from coal	300 "
Phenix City Water Works	
Electricity from Columbus Railroad Company	12 "
Bibb Mill	
Water powered mechanical drive	1650 "
Columbus Manufacturing Company	
Electricity from Columbus Power Company	1100 "
F.A. Lummus Sons Cotton Gins	
Steam power	125 "
Georgia Coffin Company	
Electricity from Columbus Railroad Company	40 "

Power from the Columbus Power Company was distributed at \$18 - \$15/horsepower/year, in the day; \$12 - \$10/horsepower/year, at night, for primary power (assured power):

Bibb Mill (mechanical & electrical power)	1650 horsepower
Hamburger Cotton Mills	300 "
Swift Mills	600 "
Muscogee Manufacturing Company	350 "
Columbus Manufacturing Company	1100 "

1000 horsepower of primary power not yet developed was reserved for Bibb.

Secondary (surplus) power cost 20% less than primary power:

Columbus Railroad Company	200 horsepower
Georgia Manufacturing Company	200 "
Muscogee Manufacturing Company	300 "

## Bibliography

### Manuscript and Typescript Sources

George J. Baldwin Papers (Columbus files), Southern Historical Collection, University of North Carolina at Chapel Hill. Baldwin, of Savannah, Georgia, was President of the Columbus Railroad Company 1906-1923. The papers, including letters to and from Baldwin's Stone and Webster associated in Boston as well as Baldwin's underling in Columbus, give an excellent day-to-day account of the workings and difficulties of a small electric utility, and aid in tracing water power development.

Farish Carter Papers, Southern Historical Collection, University of North Carolina at Chapel Hill. There is some material here which contribute information on antebellum water power and industrial development in Columbus.

Records of the Columbus Railroad Company, and Columbus Electric and Power Company, in storage at the Georgia Power Company offices, Atlanta, Georgia. These records offer a good record of expenditure for replacements, improvements, expansion, enabling one to trace the growth of the Railroad Company from a small local utility to a regional power company.

Eagle and Phenix Mills vs. Muscogee Manufacturing Company, proceedings of case filed May term 1905, Decree issued May term 1909, Muscogee County Superior Court, Records of Writ. The petitions and testimony in this case give excellent accounts of the early water power development of the City of Columbus' original water lots, the early dam and raceway, and power problems between Eagle and Phenix and Muscogee.

Eagle and Phenix Company Records, at Columbus, Georgia, include a short typescript "Eagle and Phenix River Development."

### Printed Sources

B.M. Hall and C.C. Anderson, Water Powers of Georgia (w.s. Yeats, State Geologist), Bulletin No. 3-A "A Preliminary Report," 1896; also B.M. Hall and M.R. Hall, Second Report on the Water Powers of Georgia S.W. McCallie, State Geologist), Bulletin No. 16, 1908. These Survey bulletins give an excellent picture of the extent of hydropower development on the Chattahoochee at the turn of the century, and the excitement of Georgians about the future of hydroelectricity.

The following articles (in chronological order) from the electrical trade journals, include extensive technical descriptions of dams, powerhouses, generating and transmission equipment. Articles on the later dams (Goat Rock and Bartlett's Ferry) give much greater detail than offered in this paper.

W.F. Borleau, "Electrical Equipment of a Southern City," Electrical World 30 (4 September 1897), 275-278.

"Plant of the Columbus Power Company, Columbus, Georgia," Electrical World and Engineer 43 (23 January 1904), 156-168 (almost identical article in Engineering Record (16 January 1904)).

D.H. Braymer, "The Generating System of the Columbus Power Company, Columbus Georgia," Electrical Engineering (June 1913), 247-254. Information on Goat Rock dam.

H.T. Hagemann and T.B. Parker, "The Bartlett's Ferry Hydroelectric Development," Journal of the Boston Society of Civil Engineers 13 (March, 1926), 93-125.